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ON
SANGUINEOUS TUMOURS
ON THE
SCALP IN NEW-BORN CHILDREN.

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(*From the Edin. Med. and Surg. Journal, No. 146.*)

My attention was first drawn to this subject, from having under my care a patient with one of these tumours. On examining the case I was embarrassed, nor could I find anything satisfactory regarding it in any English work on midwifery. Dr Burns merely says, "children may, especially after tedious labour be born with a circumscribed swelling on the head. This seems to contain a fluid, and has so well defined hard edges, that one who for the first time saw a case of it, would suppose that the bone was deficient. It requires no particular treatment."*

I have attempted in this paper to collect all the information which the researches of continental practitioners have afforded, and trust that it may be a means of inducing British medical men to elucidate further this interesting subject.

Sanguineous tumours may be classed under three different heads; first, those in which the blood is effused under the integuments exterior to the pericranium; the second, that which is found between the pericranium and the bone; and the third species situated deeper than either of the preceding two, between the *dura mater* and bone. These tumours are not confined to the head, but are sometimes met with on the face, breech and shoulders, or on any other region which has suffered pressure in the pelvis during labour. But the head is their principal seat, and where, from the peculiar nature of the coverings, they present distinctive characters, and often formi-

* Burns, 6th edit. p. 607.

[1841]



dable symptoms. These tumours seldom discolour the incumbent skin, which presents a pale shining appearance ; and generally the part is so little sensible that considerable pressure causes hardly any uneasiness. The child is sometimes born with them, or they appear a few days after birth, but a day or two, or even three may elapse before they are visible. In one case they may be stationary, retaining the same size which they had when first observed ; or they may go on gradually increasing, owing to the extremities of the ruptured vessels being still open, and pouring out blood. We generally find them on the right parietal bone, seldom more than one, but in some instances two or three, either isolated or communicating with each other. The fluid which these tumours contain possesses more or less of the characters of blood ; sometimes coagulated, in other cases fluid, and of a florid or venous colour, and occasionally so thin that it seems to be simply the serum of the blood mixed with the colouring matter. In cases of long standing there has been found an admixture of purulent matter.*

The first class may be divided into two varieties, first, where the effusion is supra-aponeurotic ; second, where it is sub-aponeurotic.

Supra-aponeurotic.—The first variety, where the blood is effused between the aponeurosis of the *occipito-frontalis* and the integuments, is the most common and least dangerous. The tumour is flat and irregular, losing itself in the surrounding tissues, pitting upon pressure, with fluctuation very obscure or entirely wanting ; the skin more or less discoloured ; and the hard projecting edge met with in the other varieties never presenting itself. This tumour has been called by the Germans *caput succedaneum*, and is not a sanguineous but a sero-sanguineous effusion. It differs from the other varieties in this respect, that it is not confined to one part of the cranium ; that it very soon disappears ; and is generally the consequence of pressure during delivery.

No other treatment is required than the application of some discutient lotion. Dr Geddings, however, says of this variety, “ that they may be readily cured by freely evacuating their contents,”† a point not to be doubted ; but why should we even resort to severe measures, when gentler ones are always successful ?

Sub-aponeurotic.—The second variety, where the extravasation is between the aponeurosis of the *occipito-frontalis* and the pericranium, differs in many points from the last mentioned. It has been described by Baudelocque‡ Velpeau, and Geddings ; but Valleix § states that he has only met with it in two cases, where the tumours were the effect of external violence ; and concludes, from the statements of Naegele, Zeller, and Hoere, who deny altogether its existence, that it is exceedingly rare. The evidence of the three last

* From the observations and experiments of Mr Gulliver, there is strong reason to believe that the material which resembles purulent matter in these tumours is rather dissolved fibrin. See *Medico-Chirurgical Trans.* Vol. xxii. p. 151.—EDITOR.

† *American Journal of Medical Science*, No. 46. p. 374.

‡ Baudelocque, *Art des Accouchemens*, 1re partie, Chap. 2.

§ *Clinique des Maladies des Enfants*, p. 497.

authors is only negative ; whereas that of the first mentioned and my own is positive.

In a case which I treated, it occurred on the left parietal bone of a child which had been easily born. The tumour was round and fluctuating, of a doughy feel, but not presenting the projecting osseous circle, and without discoloration of the skin. Where the tumour ceased, there could be felt a hard surrounding border, but not conveying the sensation of the osseous circle peculiar to the *cephalæmatoma*, but a hardening of the soft parts. This tumour continued to increase for about a week, but never could I discover the osseous circle, and when completely cured, it left behind it no callus. From these appearances, I think I am warranted in concluding that this was a case of sub-aponeurotic tumour. On an infant's head which I dissected, I found a sub-aponeurotic tumour, where the effusion was more serous than sanguineous. Another case confirmed by dissection is also described by Vernois.

The sub-aponeurotic tumour, then, is roundish and fluctuating, not pitting to the touch, distinctly circumscribed, not by an osseous circle, but by an induration of the surrounding tissues. From the comparatively loose attachment of the aponeurosis to the pericranium, this tumour may cross a suture ; and is larger and more diffused than the *cephalæmatoma*.

The treatment here ought to be a little more active than in the first variety : but the blood is generally absorbed of itself. If, however, after eight or ten days we see no diminution, lotions of muriate of ammonia, made more or less stimulating by alcohol, should be applied. This may be combined with pressure. Before using these we may puncture with a cataract needle, so as to draw off the contents.

What we dread in an obstinate case is that suppuration may be induced, or that from the continued irritation of the contents, the pericranium be separated from the bone.* It is remarkable that these tumours cause so little uneasiness. In the case I have before alluded to, the tumour, at first the size of a walnut, went on gradually increasing, until it extended from near the mastoid process to the posterior fontanelle. Notwithstanding this the child was otherwise in perfect health. It was punctured, more, I confess, to see the contents than for any useful end ; no lotion was used, and it entirely disappeared in the course of a fortnight. In the case described by Vernois, an incision was made, and at the end of three days suppuration took place, but before a month the wound was cicatrized, and the child did not seem to have suffered. It afterwards died of pneumonia. Local bleeding can be of no use ; nay, it may even hasten what we ought to prevent, viz. suppuration, or sloughing of the parts. Blisters are dangerous discutients, owing to the liability of mortification occurring.

Second Class. Cephalæmatoma.—Almost each author who has turned his attention to this tumour has employed a new name. Thus it has been styled *Ecchymoma capitis* by Feller and Carus ;

* See fatal cases of Dr Stuart's, American Journ. of Med. No. 46. p. 375.

Plenck added the additional epithet of *cariosum* ; * Gölis calls it *Thrombus neonatorum* ; and Palletta *Abscessus sanguineus capitis*.† I shall employ the term *Cephalæmatoma*, introduced by Zeller,‡ and now in general use.

The rareness of this disease will be seen from the fact that M. P. Dubois mentions, that at the Hôspice de la Maternité, where from 2500 to 3000 children are born every year, he only met with six cases. M. Baron gives as the proportion in the Hospital des Enfants Trouvés, two once in 400 cases : M. Valleix once in 387 ; and Hoere once in 100 cases.§

In this species the blood is extravasated between the bone and the pericranium. Formerly authors were not aware of the seat of it, hence the contradictory statements which they gave ; some stating that it was always fatal, others that it was of little consequence, and soon disappeared. Dr Geddings says, “ It must be difficult during the life of the patient to distinguish this variety from the preceding, (viz. those under the integuments), and fortunately, this is not of much consequence as far as the first is concerned ; but it may be important to discriminate this form of sanguineous tumour, and those which form in the diploë, because it would be unsafe to puncture some of the latter.”|| The correctness of this statement, however, is questionable. Dr Geddings agrees with Michaelis, Palletta, and others, who say that the disease originates in the diploë : but the opinions of Velpeau, Naegele, and Valleix, seem more probable. Michaelis and his followers found their opinion on the appearances observed on dissection, viz. necrosis or caries of the bone, the external table being destroyed ; but this is no proof that the disease commences in the diploë, as these appearances may be an effect and not a cause. If, as they say, blood is poured out from a varicose state of the veins in the diploë, why does the tumour not go on continually increasing ? Why is it that the tumour when punctured, at first, within a day or two of its appearance, gives exit to arterial blood, and ceases as soon as its contents are emptied ? Knowing how difficult it is to arrest hemorrhage from a blood-vessel in the compact tissue of bone, ought we not to expect, that if it arises from an ulcerated vessel, it should flow and again fill the cavity ? Besides, in all the accurate dissections which are recorded, we find the bone quite healthy, only covered by a few rough osseous points. No doubt, if the blood be allowed to remain long enough, necrosis of the bone may take place ; but that is a rare occurrence.

This variety is peculiarly distinguished by having a particular hard edge or ring round its base ; it is much more prominent and more circumscribed than those mentioned before ; and the skin is not discoloured.

* Doct. de cogn. et curat. morborum infant.

† Observationes Pathologicae, Cap. x. Milan, 1820.

‡ De Cephalæmatomate, &c. Heidelberg, 1822.

§ Dict. de Med. en 25 vol. Art. Cephalæmatome.

|| American Journ. Med. Vol. xlv.

The following two cases, accurately described by M. Valleix, gave a clear account of the morbid anatomy of this disease.*

CASE I.—A male child, of the usual size, and healthy, was left on the day it was born at the *crèche* of the *Hospital des Enfants Trouvés*. On the 3d of August, it was taken to the infirmary for some pustules, which appeared on different parts of the body, and for a tumour situated on the right side of the head. On inquiry it was found that the tumour had acquired its present size when the child was taken in. It was situated on the posterior and superior part of the right parietal bone; a little above and below the parietal eminence. The tumour, about the size of a goose's egg, was rounded and soft, presented distinct fluctuation, but no discoloration of skin. On drawing the finger round the base you felt a distinct projecting circular border, giving the sensation as if the parietal was perforated. A continued and strong pressure did not seem to affect the brain, or give the child uneasiness; no pulsation to be felt. On the 3d diarrhoea came on, and on the 13th the infant died. The tumour was apparently in the same state as when it entered.

Dissection.—The skin which covered the tumour having been cut crucially and with care, I exposed the aponeurosis. This was unaffected, and divided in the same manner to show the pericranium, which was detached from the bone and raised about ten lines above it, and appeared from the blood which lay below it to be of a brownish colour. A puncture made into this gave exit to about two and a-half ounces of a sanguineous liquid, inodorous, reddish, and mixed with whitish streaks. Having exposed the parietal, which formed the base of the tumour, I found it covered with a membranous layer, of the same colour as the fluid, which was raised with ease. In a single point of its extent, of the size of a shilling, above the parietal eminence, this membrane was redder, more adherent, and formed small shreds. In detaching this gently, you saw slender filaments uniting it to the parietal bone, which were torn little by little in drawing them. At the same spot the bone was rough, red, and projecting, presenting an irregular plate. The internal surface of the pericranium was soft and smooth to the touch. It appeared a little thickened and slightly red, adhering strongly to a narrow circular edge, which surrounded the base of the tumour. I tore these adhesions; the bony ridge remained fixed to the bone, and the pericranium at this point presented no trace of alteration. I then distinctly said that what is called an osseous circle was a genuine ring, a morbid production developed on the parietal bone; it was circular, raised nearly two lines, red, rough and triangular, adhering by its base to the bone. One of its faces turned towards the tumour was covered by the membrane I have described; the other, looking outwards was oblique, and furnished points of insertion for the pericranium, which was more adherent at this point than at other parts of the head. At the angle which these two faces form-

* Gazette Medicale de Paris, Sept. 1834; to be found also in 26th vol. of the Encyclographie des Sciences Medicales.

ed, were seen two layers of membrane separating from each other, the one soft and without consistence, going to cover the bone, the other firm and resisting, to form the superior part of the cyst. The external table was in no way destroyed; the parietal bone was hard and perfectly ossified. No depression was to be remarked at the portion which corresponded to the tumour; and the summit of the osseous circle was raised as much above the parts not comprised in the tumour as those which formed its base. The traces of inflammation in the intestines indicated the cause of death.

CASE II.—C. Français, born 30th July 1834, was brought the day afterwards to the *crèche*, where it remained until the 6th of August, without the tumour on its head being observed. I saw the child the same day it was sent to the infirmary, when I recognized a tumour on the right side of the head, towards the superior and posterior part of the parietal bone, of the size of half the fist, and raised more than an inch. It presented the same appearances as the last mentioned case, only the osseous circle was not so complete. On the 10th it was seized with diarrhœa, of which it died on the 15th. The tumour examined every day had remained quite stationary.

Dissection disclosed the following circumstances. The blood, weighing about three ounces and a half, was found coagulated. There was also the cellular bed adhering to the bone by small filaments, which were easily torn. Where those most adhered, the bone was covered with small osseous granulations, red and projecting, which by their aggregation formed several small plates. The pericranium was very adherent to the osseous circle. Neither in this case nor in the preceding did it present any trace of ossification.

The abnormal appearances present in this affection deserve notice.

Osseous Circle.—This circle consists of matter thrown out in order to form a boundary to the extravasation; a means which nature adopts in order to give strength, and prevent the pericranium from being further separated from the bone. It is evident from its shape that it is formed partly by the bone and partly by the pericranium. Michaelis states that this bony ring is a pathognomonic sign of this kind of tumour; but in this statement he has been opposed by Zeller, Naegele, and others, who say that they have often found this circle absent, and that the swelling raised in consequence of contusions of the head, which are soft and fluctuating in their centre, are also surrounded with a hard border. But the induration surrounding a contusion can scarcely, upon careful examination, be mistaken for it; besides, in contusion, where we have always pain upon pressure, the hardening of the surrounding tissues is comparatively quick, whereas in *cephalæmatoma* this sign does not show itself often until two or three days after the appearance of the tumour. It is a curious fact, that, as long as the tumour goes on increasing, no circle can be felt, but no sooner has it formed than the enlargement ceases.* This proves what has been before stated, that this

* Valleix, op. cit. p. 504. Fortin, Presse Medicale, 1837, No. ix. Dr Wigand, as quoted by Zeller, op. cit.

osseous border is intended to guard against further separation of the pericranium. Michaelis is mistaken, when he says that it is caused by the external table being destroyed. Such a deficiency could not give to the margin the appearance of a triangular elevated edge. Neither can it be caused, as Zeller states, by the superincumbent blood preventing the bone contained within the tumour from being developed in the same ratio as the bone exterior to it. But to refute this, we have only to look at the circle which is contained within the cyst; and must it not therefore sustain the same pressure as any other part of the base; and besides M. Valleix states, that when he pared it off, the exterior bone was on the same plane as that contained within the cyst.

Membrane covering the Bone.—Palletta states that he has always found a false white gelatinous membrane covering the bone. On the other hand, Naegele, Zeller, and Hoere, make no mention of it. Valleix, whose account is confirmed by M. Velpeau, affirms that he has seen it in four different cases. Of its existence there can be little doubt; but whether it is formed by the cellular tissue lying under the pericranium, which is found adhering to the bone after maceration, or is an exudation of coagulable lymph secreted by the bone, is not ascertained. If I may be allowed to state my opinion, I would say it was a natural membrane, which may have acquired an unusual appearance from the circumstances in which it is situated.

Causes.—Pressure on the child's head during its passage through the pelvis has been generally assigned as the cause of all these tumours. But though this is the fact in the case of the subcutaneous or *caput succedaneum*, it cannot, from many circumstances, I think, ever be the cause of the true cephalæmatome. The objections against pressure on the head during its passage through the pelvis are the following:

1. M. Valepelière gives a case where a foetus was still-born, and was known to be dead before birth, in which he found all the cavities full of blood, and a sanguineous tumour on the scalp. He referred it to apoplexy of the uterus.*

M. Billard received a foetus four or five months old. The membranes were in no way torn; and the waters of the amnion, on account of their transparency, permitted him to see the foetus, whose head was dependent and its feet raised. On the summit of the head was remarked a large sanguineous effusion. This was evidently not the effect of compression.

Schmidt has seen the foetus *in utero* affected with cephalæmatoma.† M. Fortin discovered the existence of a cephalæmatoma upon a child before its birth.‡

The case I have reported from Brouisseaux shows that the origin of the tumour must have been before delivery.§

* Encyclographie des Sciences Medicales, Trans. Med. Vol. xvi.

† Traité des Maladies des Enfants, 3d edit. p. 58.

‡ Presse Medicale, No. 9, 1837.

§ See page 13.

2. These tumours have been seen where the breech or feet presented.

3. Almost always observed after easy deliveries.

4. If it arose from pressure in the passages, we should expect pain, a symptom never absent in contusion.

Various theories have been brought forward, such as an abnormal condition of the blood-vessels, ulceration, *nævus maternus*, &c. ; but as these are not supported by facts, we need not dwell on them. The most plausible yet proposed is that suggested by Dubois, and confirmed by Valleix. In order to follow fully their reasoning, it will be necessary for a moment to advert to the anatomy of the parietal bone.

The ossification of the parietal bone commences from one point in its centre, from which bony radii are seen shooting in all directions. At birth, all the portion beneath the parietal prominence is found completely ossified, and showing no radiated appearance ; but above the prominence we find that ossification is not complete, and that the radiated appearance is most distinct. On examining the external surface of the dried bone, there are seen a number of fissures between the radii ; a few of which immediately above the prominence are also open on the internal surface. In the fresh state, this bone is exceedingly vascular, and on removing the pericranium, which is done with great facility, in proportion as the bone is vascular, we see an immense number of minute vessels running in these fissures. On applying pressure round the circumference of the bone, the radii are removed one from the other, and the vessels are torn, the consequence of which is ecchymosis. Valleix after repeated dissections states that there is frequently ecchymosis on the superior part of the head in new-born children. The following are the data which he communicated to the Anatomical Society of Paris. In twenty-eight children, aged from five to forty hours, there was in seventeen an ecchymosis on the parietal bone ; eleven of these were on the right parietal : in two the ecchymosis covered to the same extent both parietals ; in two others it was larger upon the left, and in the last two it was so circumscribed that the limits could not be fixed with accuracy. This ecchymosis never covered the sutures, which always presented their bluish-white colour. Of the eleven who presented no ecchymosis, two were twins, two the produce of a triple birth, and the other eight were aged forty hours, a period at which the ecchymosis might have disappeared. These ecchymoses were completely circumscribed, and had their seat in the subcellular tissue, which was consequently thickened, and presented a more or less violet tint. Valleix's theory, then, is that the pressure of the child's head against the mouth of the uterus causes *cephalæmatoma*. This is strengthened by the fact of its not appearing in the case of the twins, when the mouth would be dilated on the passage of the second child. But by answering the following questions, we may explain most of the objections which may be brought against this theory.

Thus it may be asked; How is it that *cephalæmatomata* are always seated on the parietal bones? First, because it is generally admitted, that the position of the foetus *in utero* is such, that one of the parietals is pressed against the *os uteri* more than any of the other bones of the head; Secondly, it is found that the structure and position of the bone afford every facility to extravasation.—How is it that it occurs more frequently on the right than on the left parietal? Because the right is found to present much more frequently than the left.—How is it that this disease is so very rare? Because the causes the most favourable for its production, viz. those in which a large part of the parietal, to the exclusion of the other parts of the cranium, presents itself to the *os uteri*, are of themselves very rare. This theory is, to all appearance, the one which bears the semblance of truth, and is therefore worthy of our belief, at least, until another more plausible can be given. It would go far to strengthen the opinion of Valleix, if future observation can show that they occur in cases where the first stage of labour is tedious and difficult, or where the membranes burst at an early period.

It is of the utmost consequence that we be able to distinguish *cephalæmatoma* from *hernia cerebri*. In both we have the hard projecting circular border, and the soft spongy feel. In *hernia cerebri* we have always a pulsation synchronous with the pulse, which some say they have felt in sanguineous tumours, but these instances are very rare.* The only way to account for this statement is that the individuals have not been very minute in their examination, and mistaken the pulsations of an artery running over the tumour, or in its neighbourhood, for a pulsating tumour. A similar error has led surgeons to mistake a tumour lying over a large artery for an aneurism. But there are three characters which distinguish them. The former never occurs at the parietal bone, where the latter is invariably met with, but is always situated either on one side of the fontanelle, or in the course of the sutures. *Hernia cerebri* retires and disappears upon pressure, producing vertigo and convulsions; whereas sanguineous tumours never give rise to any uneasiness, or disappear upon pressure. The supposed cases of *hernia cerebri*, which occurred on the parietal bones mentioned by Ledran,† Trew,‡ and Detharding, when attentively read, and their treatment considered, appear to have been only sanguineous tumours. They disappeared by the use of discutients. A case similar to that at page 13 could only be known as complicated with *hernia cerebri*, by the constitutional symptoms. *Cephalæmatomata* are distinguished from aneurism by anastomosis, and nævus, by wanting the soft feel and colour; the latter can be emptied on pressure, and on that being removed, again filled. At the same time they often enlarge upon crying or coughing. The other solid tumours in this region do not present the fluctuation which is met with in bloody tumours, and the encysted

* Levret, Journ. de Medecine, p. 411, 1772.

† Ledran, Observations, Chirurg. Tom. i. obs. 1.

‡ Commen. Lit. Nov. p. 412, 1738.

are movable, whereas the cephalæmatoma adhere closely to the bone. Abscesses of the scalp can hardly be mistaken for cephalæmatoma, as they are accompanied by pain and redness of the integuments. This, however, happened in the case of a soft, irregularly, round, fluctuating tumour, with a very distinct surrounding border, situated a little above the left parietal eminence. The medical attendant, considering it to be a sanguineous tumour, thought it improper to interfere. The child soon died, when on dissection it was found to be an abscess.* Flint has reported a very rare tumour which was situated on the occipital bone, and communicated with the sinus by an opening in the bone. This tumour was opened, and the child died from hæmorrhage.† Busch gives a similar case. As these tumours are exceedingly rare, they can hardly enter into our diagnosis, but they would be distinguished by their situation, and in that they must be affected by the circulation.

It might be of great consequence in a medico-legal point to distinguish the cephalæmatoma, which is never the consequence of external violence, from contusion and ecchymosis, which are always so.

Prognosis and Termination.—The prognosis may in general be very favourable, unless the tumour is of great size, and has been permitted to remain undiminished for twenty or thirty days. If such a period has elapsed, it may happen that the bones have become affected; but fortunately this is rare, even in cases where the blood has remained longer than the period above-mentioned.

When they terminate fatally, it is owing either to mortification of the integuments, or to necrosis of the bone, and excessive purulent discharge.

There are two different opinions with regard to the manner in which they terminate favourably. These depend upon the fact, whether the bone or the periosteum secrete osseous matter. Valleix admits that he has perceived signs of ossification of the periosteum, which has been described by Chelius, ‡ Schmidt, and lately by Naegele. This last author describes very distinctly in a letter to M. Velpeau, the manner of the termination of these tumours. He says, after describing the nature and treatment, “it is only at the end of fifteen days or three weeks that the tumour commences to diminish. Towards the fourth week it is clearly observed that it begins to resist on pressure being made. If you apply the finger on the summit, you cause a depression, which disappears on the pressure being removed. It is exactly as if you pressed upon a roll of copper-foil or upon parchment. In proportion as the tumour hardens, it diminishes and becomes insensibly flatter.§ The following, then, are the views of Naegele with regard to the manner of cure. First, the detached pericranium ossifies on its interior surface. Secondly, in proportion as the extravasated blood is absorbed, the ossified pe-

* Valleix, Clinique des Maladies des Enfants.

† Extracted by Chelius from New English Journal of Medicine, Vol. ix. 1820, p. 112.

‡ Chelius, Traité de Chirurgie, French translation, p. 110, Tome ii.

§ Velpeau, Traité des Accouchemens, Tome ii. p. 596.

ricranium approaches the bone, and finally unites perfectly with it. Thirdly, after six months or even a year an eminence is remarked on the spot where the tumour was seated. Fourthly, in children who have died at the end of six months or one year, M. Naegele has found by dissection that the parietal bone was much thicker at the seat of the tumour than at any other point of its extent.

Valleix gives a different view. He says, "I have seen two cephalæmatomata terminate without operation, and the following are the results. They existed on the same infant, and, though very small, the osseous circle was very considerable. Every day this circle made new progress from the centre to the circumference, so that daily the fluctuating part of the tumour diminished. At last only a small excavated point, containing fluid, was to be felt at the top of the osseous protuberance; but this point never offered either the hardness or the crackling noise of parchment mentioned by some authors." In a word, the ossification extended from the sides to the middle, and from below upwards, that is to say, it took its origin from the bone.*

Which of these statements are correct? I would say both are equally so.

It is quite clear from numerous experiments that the periosteum does throw out osseous matter.† To support this opinion we have even the statement of M. Valleix, who, at the same time that he denies the agency of the periosteum, confesses that once he found hard gritty particles on the interior surface of the detached pericranium; and why did he not find it in all those dissections which he has so well described? Because the tumours had only existed in the one case ten, and in the other nine days, when he examined them. Here there was no time for ossification being established. When I first turned my attention to this subject, I saw a case which fully established in my mind the part which the pericranium performs. It was shown to me by the late Mr Scott, then house surgeon to the Lying-in Hospital, Edinburgh. The tumour had existed for about thirty days; ten days before Mr Scott had felt the pericranium becoming hard, and giving out when pressed the crackling sound of parchment. The day I examined it, I felt the pericranium hard and ossified, just as if a small watch-glass was contained within the membrane. At one point there was a small osseous spoke going to the bony ring, but not quite joined to it. Mr Scott described to me another case, which he had in Greenock, where the pericranium was distinctly ossified, but where the ossification commenced at the circumference, and spread to the centre. In two other cases seen by Dr Simpson the pericranium was also ossified. It being seen that the pericranium does throw out ossific matter, and finding by dissections that the bone forming the base of these tumours is also covered by rough bony granulations, we must conclude that the ossific matter is secreted both by the pericranium and by the bone;

* *Journal Hebdomadaire*, Jan. 1836, p. 27.

† See experiments by Professor Syme, Vol 14th, *Trans. Royal Soc. Edin.*

that these unite and form the callus, which remains often for six months or even a year after the fluid contents have been absorbed. This callus, Osiander states, must not be mistaken for a very rare congenital tumour, which consists in an hypertrophy of the diploe of the parietal or other cranial bones, as, if the latter be opened, death is a certain consequence.*

Treatment.—Various means have been devised to procure resolution of these tumours. Moscati and Palletta employed the seton; a dangerous practice; and they confess that their patients frequently sunk under the acute symptomatic fever which was caused by its use. Gölis used caustic potash; but this harsh treatment was often followed by necrosis of the bone. Nestor, after fifty years' experience, says, “Perforare iteratò tumorem, vel setaceo trajicere salubre est; præ omnibus autem præstat aromatiis resolventibus sive fomentis sive cataplasmatibus sanguinem discutere.”

Discutient applications combined with slight pressure are decidedly the best applications, especially if the tumour is small; but whenever it threatens to inflame, it ought to be opened without delay. The incision should be small, and kept open for a day or two by the introduction of a small piece of lint. Zeller gives three cases showing the comparative efficacy of discutient applications with incisions. A female child, which was born with ease, had on both parietal bones a sanguineous tumour, almost equal in size. That on the left was opened, and at the end of eight days was cured. The other disappeared in five weeks under the use of discutient lotions. In another case of a male child, where the tumour was larger, and covered the superior and anterior quarter of the right parietal, it disappeared after incision in less time than the former case, and in a still shorter period in a third case.† Incision or rather puncture may be employed in cases where the tumour is very large, and where the parents of the child become anxious for its disappearance. A case is mentioned of a cephalæmatoma disappearing after epistaxis; but as this was reported to the medical man (who had not visited his patient for some time), and not seen by him, we can place no faith in the accuracy of the statement.‡

There is little chance of hæmorrhage following the incision. Smellie, however, mentions that one of his pupils having opened one of these tumours, hæmorrhage occurred, which could not be restrained, and the infant sunk in a very short time. Valleix§ gives a case where he opened the tumour, and a great quantity of dark blood flowed, and then a small quantity of arterial. “I examined with care the parts, but the hæmorrhage having ceased, I only used gentle pressure. The day after this the child died, and I saw that the compresses were deeply stained with blood, and the most dependent

* Chelius, *Traité de Chirurgie*, French translation, Tome ii. p. 110.

† Journ. *Complémentaire du Diction. des Sciences, Med.* lxi. Sept. 1822.

‡ *Presse Médicale*, No. 54, 1837.

§ *Collection of Extraordinary Cases*, Paris, 1770.

part of the tumour contained a small quantity. On dissection I found that I had cut across a branch of the posterior temporal artery."

Third Class. Subcranial.—In this variety the blood is extravasated between the *dura mater* and the cranium; an accident which Velpeau says is by no means uncommon during delivery. This, which by some is called internal cephalæmatoma, is not confined to the parietal bone, but is met most frequently in the occipital region. Baron states that, in the few cases which he has met with of internal cephalæmatoma, he has always found an external one.* In the first stage of this tumour, there is sometimes constitutional symptoms, such as twitchings of the limbs, stupor, &c.; but more often the disease proceeds insidiously, either producing inflammation of the membranes, or destruction of the bones, and only then is constitutional disturbance produced. Hence, when there is no external appearances, the diagnosis is almost impossible.

Hoere describes a case in which there was a sanguineous tumour between the *dura mater* and the bone, and a second between the pericranium and the bone. These two communicated by a loss of substance of the bone (fissure.) The internal tumour was of the size of an egg, and caused a depression in the corresponding part of the brain. The external plate had suffered no alteration; the internal, on the contrary, was carious, and even completely deficient in one point.†

An almost similar case, but complicated with *hernia cerebri*, is reported by M. Brouisseaux. A healthy young woman gave birth to an infant with a tumour upon its occiput as large as its head. The developement of the tumour was attributed to a contusion received by its mother in the first months of pregnancy. The child lived fourteen hours in a state of almost absolute insensibility. All the muscles depending upon cerebro-spinal influence were paralysed; suckling was impossible; and deglutition could hardly be performed when milk was poured into the mouth. The alvine evacuations took place naturally; the eyelids were constantly closed, and the ball of the eye remained immoveable; the pulse could be felt, though very feeble; the motion of the thorax in respiration very slight. The tumour, which was nearly round, soft, opaque, and ulcerated in many points, presented a neck one inch in length, and three in circumference. On grasping it, especially towards the cranium, a greater resistance was felt than in any other part. The child died; when, on opening the tumour, it discharged about four ounces of corrupted blood. On extending the opening, a tumour of a lively red was perceived, of the size of a turkey's egg; the opening of which gave exit to a considerable quantity of very thick black blood, and to three clots of the size of a hazel-nut. The second tumour communicated with the brain, through an opening situated behind the *foramen magnum*. It gave passage to a portion of the *medulla ob-*

* Diction. des Sciences Medicales, Art. Cephalæmatome.

† De Tumore Cranii recens natorum sanguineo, &c.

longata, six lines in length, which presented no signs of alteration, either in colour or structure.

Treatment.—I can say little on the treatment of this variety, as I have been unable to procure any cases in which remedial measures have been used. But, considering the severity of the lesion, and the delicate age of the patient, we cannot expect that art can be of any avail, either in evacuating or causing absorption of the contents.